

RIVER STAGES AND FLOODS FOR FEBRUARY 1949

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River stages during February in general averaged above normal along the Atlantic slope from southern New York through the east Gulf of Mexico drainage. Stages were also above normal over most of the Mississippi system, considerably below normal in the Sacramento Basin in California, and slightly below in portions of the west Gulf of Mexico drainage. The greatest positive departure was at Cairo, Ill., where the Ohio River averaged 18.7 feet above normal. The greatest negative departure was at Sacramento, Calif., where the Sacramento River averaged 9.6 feet below normal. The most damaging floods during the month were those due to ice action in the lower Missouri Basin. Incomplete returns indicate losses will run into several million dollars. One of the most notable of the ice break-ups and gorges occurred on the Nemaha River at Falls City, Nebr., where the previous maximum stage of record was exceeded. Considerable damage also resulted from local flooding in the Columbia Basin.

Most of the streams along the Atlantic slope remained free of ice throughout February except those in northern New England. By the end of the month most of the ice had moved out of the Merrimack River Basin in New Hampshire and Massachusetts. In the Mississippi system, there was an unusually heavy accumulation in the tributaries of the Missouri River. Ice was about 3 feet thick in the upper Missouri and about 2 feet in the Yellowstone. The ice was heavy in the upper Mississippi Basin above the mouth of the Des Moines River, ranging in thickness from 29.5 inches at Minneapolis, Minn., to 8.5 inches at Davenport, Iowa, on the 28th. It was heavy in the Des Moines Basin but was starting to break and gorge as the month closed. Ice gorges occurred in the Columbia Basin in portions of Montana, eastern Washington and eastern Oregon and caused some local flooding. All streams in the Snake Basin were low but full of ice.

Precipitation during February was quite spotty and was below normal over a wide area extending southwestward from the upper Great Lakes region through the southern half of the Western States. It was also mostly below normal along the Middle Atlantic Coastal States and in southern Florida. It was well above normal in the Columbia Basin except in a few areas, which is a striking contrast to the light precipitation of the previous month. The total snowfall during February and the

depth of snow on the ground at the close of the month is shown in chart VII in the illustration section of the Review. Precipitation during the winter of 1948-1949 (December-February) was above normal over the country except in California, Nevada, North Carolina, and Florida and is shown in percent of normal in figure 1.

St. Lawrence Drainage.—Slight flooding occurred in the Lake Michigan drainage in the Shiawassee and Red Cedar Rivers due to the moderate rain (0.85 inch) on the 15th-17th. No damage resulted. Much of the snow and ice cover in the Grand River Valley melted from the mild temperatures and moderately heavy rains on the 12th and 13th and caused the streams to rise rapidly to near bank-full stage. No flooding occurred except in the low suburban areas of Grand Rapids, Mich.

A spring freshet occurred in the Lake Erie drainage in the St. Marys, St. Joseph, and Maumee Rivers during the latter half of the second decade of February. This freshet was augmented by release of considerable amounts of ground water due to thawing weather. It was not very severe and the damage resulting was minor as the lowland areas are flooded every year.

Atlantic slope drainage.—Slight flooding occurred on the Cape Fear, Neuse, and Roanoke Rivers in eastern North Carolina due to the moderate rains that occurred at various times during the month. The frequency and amount of rainfall kept the Roanoke at or slightly above flood stage at Williamston throughout most of the month.

Moderate to heavy rains on the 9th-10th caused light overflows in the Edisto River in South Carolina. Heavy rains on the 20th resulted in some flooding on the Pee Dee and Saluda Rivers. The rainfall averaged about 2 inches during the 24-hour period over the Saluda and Broad Rivers.

Heavy rainfall (2 inches) on the 9th-10th caused light flooding in the Savannah and Ogeechee Rivers. No damage of consequence resulted.

The most important rises in the Altamaha River system in Georgia occurred as a result of rainy conditions from the 4th to 10th. Amounts of 1 to 2 inches were fairly common and widespread during the 24-hour periods ending on the mornings of the 5th, 7th, 9th, and 10th. Flood stages were reached only in the lower portions of the Ocmulgee, Oconee, and in the upper Altamaha. Flood stages were not greatly exceeded and no appreciable losses were sustained.

East Gulf of Mexico.—Moderate flooding occurred in the lower portion of the Apalachicola River in Georgia due to the heavy rain over the basin on the 5th, 7th, 9th, and 10th. Moderate to heavy rains occurred again on the 16th, 19th, and 27th.

The lower reaches of the Warrior and Tombigbee Rivers in Alabama remained above flood stage throughout most of the month due to the high initial stages resulting from the severe flooding in January and the occasional heavy rains during February.

The Pearl River remained above bank-full stage throughout the month at and below Jackson, Miss. The stages during February were not as high as those during January except at Pearl River, La. The Chickasawhay at Enterprise, Miss., was briefly above flood stage and the Pascagoula River at Merrill, Miss., was above bank-full stage for about 1 week. The flood condition on the intermediate and upper reaches of the Pearl River was maintained by the numerous showers which culminated in generally excessive rain on the 15th. This storm originated in the Gulf of Mexico and moved northeastward across southern Mississippi and central Alabama, producing excessive rainfall over the lower part of the head-

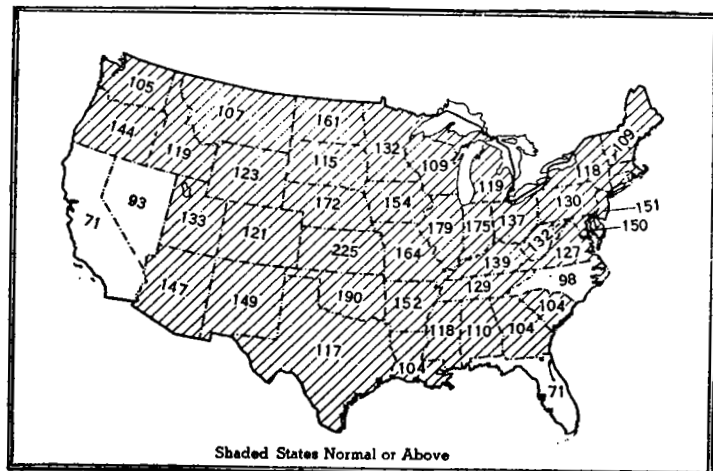


FIGURE 1.—Percentage of normal precipitation by states, Winter (December-February) 1948-49.

waters of the Pearl River and throughout the intermediate reaches, as well as over the middle reaches of the Leaf and Chickasawhay and the headwaters of the Pascagoula River. This excessive rainfall added to the existing flood. The prolonged flooding of the Pearl River in the Jackson area delayed oil drilling operations in the flood plain in that area but added little, if any, to the hazards that already existed due to the January flood.

Upper Mississippi Basin.—Precipitation has been above normal throughout the winter in the upper Mississippi Basin. During the winter season, precipitation averaged 180 percent of normal in the Mississippi Basin above La Crosse, Wis., 185 percent in the Minnesota River Basin, and 137 percent in the Wisconsin River Basin. A summary of the precipitation during January and February is given in table 1.

TABLE 1.—*Precipitation data for Upper Mississippi Basin, January and February 1949*

Basin or area	Observed (inches)	Normal (inches)	Excess (inches)	Percent of normal
Mississippi River (above La Crosse, Wis.)	2.24	1.50	0.74	149
Mississippi River (La Crosse to Keokuk, Iowa)	3.49	2.81	.68	124
Mississippi River (Keokuk to St. Louis, Mo.)	6.96	4.01	2.95	174
Des Moines River	3.11	2.08	1.03	149
Entire Mississippi Basin (above Missouri River)	3.95	2.60	1.35	152

The following is a summary of the water equivalent of the snow cover in the Upper Mississippi Basin on the 28th of February:

State and station	Water equivalent (inches)
Wisconsin:	
Berlin	1.6
La Crosse	0.9
Lady Smith	3.5
Madison	.8
Plattsville	2.5
Minnesota:	
Bemidji	2.8
Madison	2.4
St. Cloud	2.7
St. Paul	.7
Iowa:	
Mason City	.8

Light to moderate flooding occurred in the southern portion of the Upper Mississippi Basin in southern Iowa, western Illinois, and eastern Missouri during the last half of February. Flooding along the Skunk River at Augusta, Iowa, and the Mississippi at Hannibal, Mo., was due partly to ice action.

The Raccoon River at Van Meter, Iowa, and the Des Moines River at Tracy and Eddyville, Iowa, exceeded flood stage during the latter part of the month. The flooding was due principally to run-off from snow-melt caused by the mild weather during the last half of the month and the accompanying ice action. Colder weather at the close of the month caused a temporary slackening of run-off with the Raccoon and the Des Moines River at Tracy, Iowa, falling below bank-full stage. The ice was still holding at the end of February.

Flooding along the Illinois River was caused by moderately heavy rain (0.8 inch) on the 12th–13th in the upper reaches of the basin. Crests in the lower reaches were delayed considerably and were somewhat higher as unseasonably mild weather and occasional rains during that period caused considerable snow-melt and gorging of ice.

Missouri Basin.—Precipitation during February was considerably below normal in the Missouri Basin. It

ranged from 3 percent of normal in the Platte Basin to 96 percent of normal in the Lower Missouri and averaged 70 percent of normal. During January it ranged from 137 percent of normal in the upper Missouri to 316 percent of normal in the lower reaches of the Missouri and averaged 268 percent of normal over the entire basin. A summary of the average precipitation conditions during January and February is given in table 2.

TABLE 2.—*Precipitation data for Missouri River Basin, January and February 1949*

Basin or area	Observed (inches)	Normal (inches)	Excess (inches)	Percent of normal
Upper Missouri (Plains Area above Bismarck, N. Dak.)	1.15	0.98	0.17	115
Middle Missouri and Tributaries (Bismarck to Sioux City, Iowa)	1.38	1.12	.26	123
Lower Missouri (below Sioux City)	6.50	3.15	3.35	206
Platte Basin	1.59	1.16	.43	137
Kansas Basin	2.69	1.45	1.24	186
Entire Missouri Basin	2.66	1.57	1.09	169

The only appreciable snow cover remaining in the Missouri Basin by the end of the month was in North Dakota, northern South Dakota and portions of Montana, Wyoming, and northeastern Nebraska. The only snow cover remaining in Missouri, Kansas, and southern Nebraska was on the steep north slopes and in the heavily timbered areas.

The floods in the Missouri Basin during February were due principally to moderate run-off from snow-melt accompanying the break up of heavy ice.

An extensive, severe ice gorge formed during January on the Missouri River just above Leavenworth, Kans. Continuous heavy floating ice from upstream caused the jam to build northward, until by the end of the month the Missouri was almost a solid mass of jagged ice above Leavenworth. Backwater flooding extended progressively northward and was general throughout that area. Some large floes stood on end and were visible from behind levees. Across from Atchison, Kans., ice acting as a glacier allowed water to inundate the community of Winthrop, Mo. which was evacuated. Three resort lake areas across from Atchison were also evacuated as river water caused the lakes to overflow, surrounding many cottages.

As the Missouri River ice gorge extended, a series of thaws caused ice break ups and gorges on rivers and tributaries in southeast Nebraska, southern Iowa, and northern Missouri. One of the most notable was on the Nemaha River which reached a new all-time high of 26.9 feet at Falls City, Nebr., exceeding the previous record of 25.6 feet of June 13, 1947. Another gorge took out at least one bridge on the Nodaway River near Burlington Junction, Mo. As thaws recurred and tributary gorges broke, these swollen streams added to the burden of the already ice-plagued Missouri. For the second consecutive month the Missouri River at Atchison, Kans., crested 1 foot under the all-time high mark of 26.4 feet established in 1881. Two temporary ice breaks occurred at St. Joseph, Mo.

Moderate to severe flooding occurred in the upper reaches of the Republican, Solomon, and Blue Rivers in Kansas and Nebraska due to run-off from snow-melt and backwater from ice gorges that formed as the heavy ice in the channels broke up. The most extensive gorges were formed in the vicinity of Guide Rock, Nebr., and Scandia, Kans., on the Republican and at Beloit, Kans., on the Solomon. There was also a considerable blocking effect from ice jams at Cambridge, Nebr., and below Con-

cordia on the Republican as well as along the lower reaches of the Big Blue, but in these areas the overflow was quite restricted.

The Ohio Basin.—The Ohio River at the beginning of the month was receding below flood stage from a minor flood (1–3 feet above flood stage) in the reach from Point Pleasant, W. Va., to above Evansville, Ind. In the reach above Point Pleasant a steady recession was already in progress, while at Evansville and below rising stages prevailed until the 4th with crests up to 18 feet above flood stage at dam 50. From the 5th to the 13th a general recession prevailed throughout the Ohio River reaching pool conditions above Point Pleasant on the 10th.

Heavy general rain occurred over the basin from the 13th–15th, averaging 1.5 inches in the upper portion and nearly 4 inches in the lower reaches. The rain averaged about 2 inches in the upper White and Wabash rivers and from 3 to 4 inches in the lower reaches. Rapid rises occurred on the Ohio and tributaries. The lower White and Wabash Rivers crested 5 to 9 feet above flood stage, the Green, 3 to 15 feet above flood stage and the Scioto slightly above bank-full stage. The Licking, lower Kentucky, Little Miami, and Hocking Rivers crested slightly below flood stage. The Ohio, in the reach from dam No. 14 to dam No. 25 crested from 23 to 30 feet on the 18th; exceeded 40 feet in the lower portion of the reach from Point Pleasant, W. Va., to dam No. 30; and from 45 to 50 feet in the reach from Portsmouth, Ohio, to dam No. 45 by the 21st. Several stations in the lower reach of the Ohio had not dropped below flood stage before these general rains began and as a result some of these stations remained above flood stage throughout February.

Several periods of light to moderate rainfall occurred during the latter part of the month causing only moderate or slight rises on most tributaries and slowing down the recession on the Ohio. At the close of the month the Ohio was falling steadily from dam No. 12 to Cairo, Ill., with the upper reaches approaching pool conditions and the lower reaches below Evansville, Ind., approaching bank-full stage.

White Basin.—The flooding in the White Basin during February was a continuation of the floods that began during the last decade in January. These floods were due to torrential rains accompanying the Low moving north-eastward from Texas across Arkansas. Several stations in Arkansas reported amounts between 8 to 10 inches during the week ending January 27. It was the wettest January on record except for 1937.

The stages on the White and Black were high but not record breaking except at Georgetown, Ark., where the previous maximum of record (31.4 feet) on May 18, 1943, was exceeded by 1.4 feet on January 31. The flood above Batesville, Ark. was not as severe as on the lower White. It, however, was severe in the lowlands in the reach between Batesville and Newport. State highway No. 14 between those cities was under water for several days. Central Avenue in Batesville was flooded by the Polk Bayou. The Missouri Pacific, White River Division Tracks at Creswell, Ark., four miles south of Calico Rock, were blocked by a landslide from rain-soaked earth that slid over the tracks. Walnut Ridge and Jonesboro, Ark. reported local flash floods. The levees at Jacksonport, Ark., were topped causing flooding in that section. Severe damage resulted to highways and bridges.

Arkansas Basin.—Widespread minor flooding occurred in the Arkansas Basin in Kansas and Oklahoma during February. The flooding on the Ninnescah, Cottonwood,

Little Arkansas, and Neosho Rivers and Cow Creek was due to rapid snow-melt. Ice jams occurred in the vicinity of Peck, Kans., on the Ninnescah and above Hutchison, Kans., on the Arkansas River and Cow Creek, which helped to produce the floods in these streams. Only a small amount of precipitation or snow-melt was necessary to cause these floods as the streams remained from one-half to three-fourths bank-full throughout the month due to the heavy ground-flow from the saturated ground.

One- to three-inch rains on the 13th and 14th in east-central Oklahoma resulted in minor flooding along the Deep Fork Creek near Dewar, Okla. Heavy run-off occurred as the ground was thoroughly saturated from the heavy precipitation during January. Damage was negligible.

Precipitation during the month was not excessive as during January but it was sufficiently high to cause the antecedent soil index to continue much above normal.

Red Basin.—The flooding in the Red Basin during the early part of the month was due to the unusually heavy rains and floods during the latter part of January. In western Arkansas the Mena area was hard-hit with several business establishments reporting 6 to 8 inches of water in their buildings. For a while it appeared as if the new earthen dam at the city's reservoir might not hold but fortunately it did. Traffic was halted on Highway 8 when Carter Creek flooded a low bridge. At DeQueen, Ark., local creeks flooded highways washing away a stack of lumber on Highway 27. At Russellville, Ark., a local flood forced 100 students and their families from Arkansas Tech to evacuate their homes. Six persons lost their lives in these floods.

Scattered heavy rains over the headwaters of the Sulphur River on the 12th resulted in some flooding at Naples, Tex. Additional heavy rain (2.5 inches) over the basin on the 23d–24th produced general flooding along the entire river, a distance of 188 miles.

Lower Mississippi Basin.—The St. Francis River continued in flood from the latter part of January into the first week of March. The stage at Fisk, Mo., remained nearly stationary for several days at about 4 feet above flood stage from the latter part of January through the first week of February due to the constant discharge from the reservoir above Wappapello Dam which had been filled by the heavy rains in January. Locally light to moderate rains occurred on the 4th which caused a slight rise at St. Francis, Ark. Moderate to heavy rains occurred on the 14th and 15th, averaging about 3 inches in the upper portion, 5 inches in the middle, and 1.8 inches in the lower reaches. The stage at Fisk, Mo., rose only 0.5 foot due to the regulation of the Wappapello Dam.

Rainfall averaged near or slightly below normal in the Yazoo-Tallahatchie Basin during the month. The rivers remained nearly stationary or fell slowly throughout February except from the 7th–10th, as the rains were well distributed and not very heavy. The Yazoo was still about 6 feet above flood stage at the end of the month but had receded to a stage of 2.3 feet below bank-full stage at Greenwood, Miss. The Tallahatchie at Swan Lake, Miss., was 0.4 foot above flood stage and was falling very slowly.

The lower Mississippi continued above flood stage at New Madrid and Caruthersville, Mo., from early in January through the first week in March. It receded steadily through the first half of February and rose again during the last half cresting near the end of the month slightly lower than the first. The second rise was due to moderately heavy rains over the middle Mississippi and

Ohio Basins from the 13th to the 15th. Moderate rains (1.5 inches) were reported over the Tennessee and Cumberland Basins on the 19th and 20th.

The main damage resulting was to corn and cotton crops which had not been harvested due to wet weather, and flooding of pasture lands.

West Gulf of Mexico Drainage.—Heavy and widespread rains occurred over the upper Trinity Basin on the 23d to the 25th and caused rapid rises to above bank-full stage. It rose 15 feet at Dallas, Tex., from a stage of 17 feet to 4 feet above flood stage, during the 24-hour period ending at 7 a. m. on the 24th. The stage was set for heavy run-off prior to this storm as the soil was saturated from the rain on the 20th and 21st. No damage of consequence occurred as most vegetation is dormant during February.

The upper Sabine in Texas was receding in the beginning of the month from the minor flood of January. The crest flattened out in moving downstream and flood stage was not reached at Logansport, La., or Milam, Tex., although it exceeded flood stage slightly below at Bon Wier, Tex., due to the scattered rains in the middle basin on the 9th and 10th. Most of the damage occurred in the Gladewater, Tex., area in the loss of oil production.

A minor flood occurred in the lower Trinity at Liberty, Tex., from the 27th to March 2. This flood was caused by excessive rains, ranging from 1 to 4 inches from the 23d to the 26th. The rain averaged 2.18 inches during the 4-day period in the reach below Long Lake, Tex. No damage occurred from this overflow.

Heavy rains during the early morning hours of the 25th in the Del Rio-Eagle Pass, Tex., area caused the Rio Grande to exceed flood stage in that area. The rainfall averaged 3 to 5 inches and occurred in period of 2 to 4 hours. Some inconvenience was experienced by travelers due to the temporary closing of highways; otherwise no damage occurred.

Columbia Basin.—Generally minor flooding occurred on the main stem of the Willamette River and along the lower reaches of the principal tributaries from the 16th to the 26th and in a few of the more minor tributaries from the 10th to the 12th. Record heights were reached on the headwaters of the Tualatin and the Yamhill during the period of record.

The flooding occurred in connection with the breakup of an exceptionally long, cold winter. Precipitation was light during January with numerous light snows in the valley and heavier amounts at higher elevations. The soil was frozen to depths ranging from a few inches to as much as 7 inches.

The first break in the weather occurred on the 10th but it was only temporary. Moderate to moderately heavy precipitation occurred on that date for a period of about 20 hours. Severe flooding and considerable damage occurred along low lying areas of a few small streams in western Oregon.

The main break in the weather began on the 18th. The rains over the Willamette basin were moderate to heavy except light to moderate in the tributaries of the Upper Willamette. Light to moderate rains occurred for 2 to 3 days in some areas. In other areas the storm was comparatively short and for that reason the flooding along the main stem of the Willamette and most of its tributaries was minor except on the Santiam and Yamhill. No damage except erosion occurred on the main stem of the Willamette and the principal tributaries.

Localized destructive flooding occurred on Johnston Creek (east of Portland) and on the lower reach of the Tualatin River. Intense local flooding occurred in north-eastern Oregon and southeastern Washington. This flood-

ing was due to the warm light to moderate rains on the 21st and the run-off from snow melt caused by the warm weather that followed during the remainder of the month. The precipitation at Portland, Oreg., during February (11.43 inches) was the greatest since 1881.

Chehalis and Puget Sound Drainage.—Moderate flooding occurred on two occasions along the Chehalis River in Washington and its upper tributaries, the Newaukum and Skookumchuck. The first flood on the 17th and 18th was due to effective rainfall averaging 2.92 inches during a period of 36 hours. There was a moderate snow cover over the basin prior to this storm, especially at elevations above 1,000 feet, and a contributing cause of the flood was the run-off from the melting snow. The second flood from the 22d-24th was due to effective rainfall averaging 1.92 inches during a period of 48 hours. Moderate damage resulted from the flooding. The flooding along the Snohomish and Satsop Rivers was of a minor nature and no losses were reported.

FLOOD STAGE REPORT FOR FEBRUARY 1949

[All dates in February unless otherwise specified]

River and station	Flood stage	Above flood stages— dates		Crest ¹	
		From—	To—	Stage	Date
ST. LAWRENCE DRAINAGE					
Lake Michigan					
Red Cedar:	Feet			Feet	
Williamston, Mich.....	7	14	16	8.8	15
East Lansing, Mich.....	8	14	17	9.4	16
Lake Huron					
Shiawassee: Owosso, Mich.....	7	15	16	7.6	15
Lake Erie					
St. Marys: Decatur, Ind.....	13	15	18	16.6	16
St. Joseph: Montpelier, Ohio.....	10	15	20	13.2	16
Maumee:					
Fort Wayne, Ind.....	15	15	20	18.2	17
Defiance, Ohio.....	10	16	18	11.3	17
ATLANTIC SLOPE DRAINAGE					
Roanoke: Williamston, N. C.....	10	5	(²)	10.9	16, 17
Neuse: Smithfield, N. C.....	13	13	13	13.1	13
Cape Fear: Elizabethtown, N. C.....	20	22	23	21.8	22
Pee Dee: Pee Dee, S. C.....	19	22	27	20.1	24
Saluda:					
Pelzer, S. C.....	6	19	22	7.5	20
Chappels, S. C.....	13	9	10	14.6	9
Edisto:					
Orangeburg, S. C.....	8	10	15	9.3	11
Givhans Ferry, S. C.....	10	13	Mar. 2	11.5	18
Savannah: Butler Creek, Ga.....	21	10	12	22.8	11
Ogeechee:					
Midville, Ga.....	6	14	15	6.3	14
Dover, Ga.....	7	13		7.9	16
Ocmulgee: Abbeville, Ga.....	11	13	(²)	12.8	16
Oconee:					
Milledgeville, Ga.....	20	10	11	21.4	10
Mt. Vernon, Ga.....	16	14	19	17.4	16
Altamaha: Charlotte, Ga.....	12	7	(²)	17.7	20, 21
EAST GULF OF MEXICO DRAINAGE					
Apalachicola: Blountstown, Fla.....	15	Dec. 1	(²)	23.6 20.6 20.9	Dec. 6 Jan. 11 14
Coosa: Gadsden, Ala.....	20	19	22	20.6	21
Cahaba: Centreville, Ala.....	23	16	17	23.5	17
Alabama: Millers Ferry, Ala.....	40	16	27	46.1	21
Black Warrior:					
Tuscaloosa Lock and Dam, Ala.....	47	17	20	49.0	17
Lock No. 7, Eufaw, Ala.....	35	6 17	15 27	40.5 46.2	8 23
Tombigbee:					
Gainesville, Ala.....	36	Jan. 7	24	53.7	Jan. 11
Lock No. 4, Demopolis, Ala.....	39	Jan. 9	(²)	65.2	Jan. 14
Lock No. 3.....	33	Nov. 2	(²)	61.5	Jan. 16
Lock No. 1.....	31	Jan. 6	(²)	43.8	20
Bogue Chitto: Franklinton, La.....	11	17	19	11.6	19
Chickasawhay: Enterprise, Miss.....	20	18	19	20.5	18
Pascagoula: Merrill, Miss.....	22	19	26	23.7	22
Pearl:					
Jackson, Miss.....	18	Nov. 20	(²)	32.9 33.1 30.5 29.5 20.8 22.9 20.8	Dec. 6. Jan. 12. Jan. 26. 1. Jan. 7. Jan. 20. 17.
Monticello, Miss.....	15	Jan. 5	(²)		

See footnotes at end of table.

FLOOD STAGE REPORT FOR FEBRUARY 1949—Continued

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River and station	Flood stage	Above flood stages— dates		Crest ¹	
		From—	To—	Stage	Date
EAST GULF OF MEXICO DRAINAGE— continued					
Pearl—Continued	<i>Feet</i>			<i>Feet</i>	
Columbia, Miss.....	17	Jan. 7	(?)	19.7 22.4 21.0	Jan. 11. Jan. 23. 19.
Pearl River, La.....	12	Nov. 24	(?)	18.7 15.0 15.8 16.1	Nov. 30. Jan. 15. Jan. 27. 22.
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
Pecatonica: Freeport, Ill.....	10	25	(?)	12.2	Mar. 1.
Rock: Moline, Ill.....	10	19	(?)		
Iowa: Wapello, Iowa.....	10	27	27	10.0	27.
Skunk: Augusta, Iowa.....	15	25	(?)	16.3	26.
Raccoon: Van Meter, Iowa.....	13	24	25	13.7	24.
Des Moines:					
Tracy, Iowa.....	14	24	27	17.3	25.
Eddyville, Iowa.....	15	24	(?)	19.6	27.
Illinois:					
Morris, Ill.....	13	14 13	14 15	13.4 19.1	14. 14.
Peru, Ill.....	17	19 22 25	20 22 26	18.0 17.1 17.6	19. 22. 25.
Havana, Ill.....	14	18	(?)	16.6	24-27.
Beardstown, Ill.....	14	5 18	9 (?)	14.4 18.5	7. 27.
Meramec:					
Sullivan, Mo.....	11	15	17	18.6	15.
Pacific, Mo.....	11	16	18	19.0	18.
Valley Park, Mo.....	14	16	19	20.9	17.
Mississippi:					
Hannibal, Mo.....	13	21	21	13.3	21.
Louisiana, Mo.....	12	20 26	21 (?)	12.1 12.8	21. 27.
Missouri Basin					
Nemaha: Falls City, Nebr.....	20	12 17 23	13 20 25	21.6 26.9 25.7	12. 19. 24.
Tarkio: Fairfax, Mo.....	17	24	24	20.4	24.
Nodaway: Burlington Junction, Mo.	16	24	27	18.3	24.
Platte: Agency, Mo.....	20	24	28	24.4	27.
Solomon: Beloit, Kans.....	18	12 19 24	14 21 27	21.0 21.5 26.9	13. 20. 26.
Little Blue:					
Endicott, Nebr.....	9	24	Mar. 2	12.5	25, 27.
Hanover, Kans.....	14	26	26	19.0	26.
		19	20	22.8	19.
Big Blue: Randolph, Kans.....	22	25	Mar. 1	23.0 23.4	25. 28.
Republican:					
Benkelman, Nebr.....	5	22	24	5.6 5.4	23. 14.
Cambridge, Nebr.....	5	13	Mar. 4	6.8 8.5	19. 23-24.
Orleans, Nebr.....	9	24	26	10.6	25.
Guide Rock, Nebr.....	10	24	Mar. 6	12.7	24.
Scandia, Kans.....	10	25	Mar. 5	14.5	5.
Stranger: Tonganoxie, Kans.....	23	24	26	24.4	26.
Grand:					
Pattonsburg, Mo.....	20	24	26	25.8	25.
Gallatin, Mo.....	20	25	25	20.3	25.
Chillicothe, Mo.....	18	19 24	20 (?)	19.8 27.9	19. 25.
Sumner, Mo.....	25	19 24	22 (?)	28.0 31.2	20. 27.
Brunswick, Mo.....	12	25 19	(?) 19	13.7 19.0	26. 19.
Chariton: Novinger, Mo.....	19	24 Jan. 15	(?) Jan. 17	23.6 20.3	25. Jan. 16.
Lamine: Clifton City, Mo.....	15	Jan. 23 14	Jan. 25 14	23.0 15.4	Jan. 24. 14.
Blackwater: Blue Lick, Mo.....	25	Jan. 16 13	Jan. 19 19	27.8 29.7	Jan. 17. 16.
Marais des Cygnes:					
La Cygne, Kans.....	25	13	14	26.5	14.
Trading Post, Kans.....	24	14	15	24.3	14.
Osage:					
Osceola, Mo.....	20	17	19	22.6	18.
Warsaw, Mo.....	31	17	19	31.6	17, 18.
Missouri:					
Nebraska City, Nebr.....	15	Jan. 23 27	Jan. 24 (?)	16.2 15.1	Jan. 24. 28.
Nodaway, Mo.....	17	Jan. 24 6	Jan. 28 (?)	20.1 21.0	Jan. 24. 20, 25, 26.
St. Joseph, Mo.....	17	20 26	21 (?)	17.2 17.7	21. 27.
Atchison, Kans.....	20	Jan. 15 3	1 (?)	20.0 25.4	1. 28.
Ohio Basin					
Scioto:					
La Rue, Ohio.....	11	16	16	12.2	16.
Prospect, Ohio.....	10	17	17	10.2	17.
Circleville, Ohio.....	14	16	17	15.7	17.
Piketon, Ohio.....	15	16	18	20.0	16.

See footnotes at end of table.

River and station	Flood stage	Above flood stages— dates		Crest ¹	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM—continued					
Ohio Basin—Continued					
	Feet			Feet	
Barren: Bowling Green, Ky.....	28	{ 15	18	31.3	17.
Green:		{ 21	21	28.2	21.
Munfordville, Ky.....	28	{ 15	21	43.0	17.
Lock No. 6, Brownsville, Ky.....	28	{ 14	23	43.7	18.
Lock No. 4, Woodbury, Ky.....	33	{ 14	26	46.3	19.
Lock No. 2, Rumsey, Ky.....	34	{ 1	12	41.2	2.
		{ 15	(?)	43.1	25.
West Fork:					
Anderson, Ind.....	10	16	16	12.1	16.
Spencer, Ind.....				18.4	17.
Elliston, Ind.....	18	{ Jan. 18	2	26.6	Jan. 23.
		{ 16	21	24.8	18.
Newberry, Ind.....				18.9	19.
Edwardsport, Ind.....	12	{ Dec. 30	7	17.8	Jan. 2.
		{ 15	(?)	24.1	Jan. 25.
				20.9	19-20.
East Fork:					
Columbus, Ind.....				11.3	16.1
Seymour, Ind.....	14	16	18	17.0	16.1
Bedford, Ind.....				27.3	1.
				24.4	19.
Williams, Ind.....	10	{ Jan. 23	3	18.7	Jan. 28.
		{ 19	21	12.2	20.
Shoals, Ind.....	25	{ Jan. 25	3	30.5	Jan. 29.
White:					
Petersburg, Ind.....	16	{ Jan. 4	8	25.5	Jan. 26.
		{ 16	26	22.6	22.
Hazleton, Ind.....	16	{ Jan. 4		27.9	Jan. 27.
				23.6	22-23.
Wabash:					
Bluffton, Ind.....	10	15	18	10.4	17.
Wabash, Ind.....	12	15	18	18.3	15.
La Fayette, Ind.....	11	{ Jan. 18	1	21.7	Jan. 20-21
		{ 15	27	20.4	17.
Covington, Ind.....	16	{ Jan. 19	2	25.0	Jan. 22.
		{ 16	27	23.8	18.
Terre Haute, Ind.....	14	{ Jan. 5	5	20.6	Jan. 23.
		{ 16	(?)	19.8	20.
Hutsonville, Ill.....				23.2	21.
Riverton, Ind.....				20.5	22.
Vincennes, Ind.....	16	{ Jan. 7	8	23.9	27, 28.
		{ 17	(?)	21.0	23-24.
Mount Carmel, Ill.....	17	{ Jan. 5	10	25.9	Jan. 28.
		{ 17	(?)	23.2	23.
New Harmony, Ind.....	15	{ Jan. 7	11	22.0	Jan. 29.
		{ 19	(?)	18.6	25.
Cumberland: Lock F, Eddyville, Ky.....	50	21	27	53.1	24.
Ohio:					
Tell City, Ind.....	38	Jan. 27	6	43.7	Jan. 31.
Dam No. 46, Owensboro, Ky.....	41	Jan. 29	6	42.6	1.
Dam No. 47, Newburgh, Ind.....	38	{ Jan. 26	9	45.2	1.
		{ 17	(?)	42.6	22.
Evansville, Ind.....	42	{ Jan. 30	6	43.1	2.
Dam No. 48, near Henderson, Ky.....	38	{ Jan. 27	11	45.9	2.
		{ 18	(?)	42.2	23.
Mount Vernon, Ind.....	35	{ Jan. 26	12	45.0	3.
		{ 18	(?)	40.2	25.
Dam No. 49, Uniontown, Ky.....	37	{ Jan. 26	13	48.3	4.
		{ 19	(?)	42.6	25.
Shawneetown, Ill.....	33	Jan. 7	(?)	38.8	Jan. 14.
				49.2	4.
				43.1	26.
Dam No. 50, Fords Ferry, Ky.....	34	Jan. 7	(?)	41.7	Jan. 15.
				52.2	4.
Dam No. 51, Golconda, Ill.....	40	21	Mar. 2	46.0	26.
Paducah, Ky.....	39	20	Mar. 3	43.5	25.
				42.8	25.
Dam No. 52, Brookport, Ill.....	37	Jan. 22	Mar. 6	48.0	Jan. 30.
				44.8	3.
				47.7	Jan. 15.
Dam No. 53, near Mound City, Ill.....	42	Jan. 7	Mar. 7	52.6	Jan. 30.
				50.5	25.
Cairo, Ill.....	40	Jan. 9	Mar. 8	44.4	Jan. 16.
				50.5	Jan. 31.
				49.2	26.
White Basin					
Buffalo: Gilbert, Ark.....	30	Jan. 24	Jan. 24	41.6	Jan. 24.
Black:					
Poplar Bluff, Mo.....	16	Jan. 25	Jan. 26	18.7	Jan. 25.
Black Rock, Ark.....	14	Jan. 18	(?)	28.5	Jan. 25.
White:					
Cotter, Ark.....	21	{ Jan. 28	Jan. 29	23.8	Jan. 28.
		{ 16	18	22.2	18.
Calico Rock, Ark.....	19	{ Jan. 25	Jan. 30	37.7	Jan. 25.
		{ 15	19	24.0	15.
Batesville, Ark.....	23	{ Jan. 25	1	37.6	25.
		{ 15	20	29.8	16.
Newport, Ark.....	26	{ Jan. 25	8	34.0	Jan. 28.
		{ 16	25	30.9	19.
Augusta, Ark.....	32	Jan. 25	Mar. 4	39.3	Jan. 30.
Georgetown, Ark.....	21	Jan. 22	Mar. 8	32.8	Jan. 31.
				27.4	22.
Des Arc, Ark.....	24	Jan. 25	Mar. 13	37.4	2.
				30.6	24.

FLOOD STAGE REPORT FOR FEBRUARY 1949—Continued

FLOOD STAGE REPORT FOR FEBRUARY 1949—Continued

River and station	Flood stage	Above flood stages— dates		Crest ¹	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM—continued					
White Basin—Continued					
White—Continued	Feet			Feet	
Clarendon, Ark.....	26	Jan. 22	(?)	35.3	6.
St. Charles, Ark.....	25	Jan. 11	(?)	31.5	27.
				33.9	10.
Arkansas Basin					
Cow Creek: Lyons, Kans.....	15	10		18.5	11.
		16		18.5	19.
		12	14	20.3	12.
Little Arkansas: Sedgwick, Kans.....	18	18	19	19.3	18.
		27	27	18.3	27.
Ninnescah: Peck, Kans.....	17	12	12	18.1	12.
Verdigris:					
Independence, Kans.....	30	13	14	35.0	14.
Claremore, Okla.....	38	16	17	39.0	17.
Inola, Okla.....	42	16	18	43.6	18.
Cottonwood: Emporia, Kans.....	20	12	13	20.7	12.
Neosho:					
Emporia, Kans.....	22	12	13	23.6	13.
		18	18	22.5	18.
Iola, Kans.....	15	12	14	17.1	13.
Chanute, Kans.....	20	13	15	22.4	13-14.
Oswego, Kans.....	17	13	18	20.3	16.
Deep Fork: Dewar, Okla.....	18	15	16	18.6	15.
Poteau: Poteau, Okla.....	24	14	17	27.0	16.
Petit Jean: Danville, Ark.....	20	Jan. 25	Mar. 6	27.8	Jan. 25.
Arkansas:					
Arkansas City, Kans.....	16	19	19	16.2	19.
Webbers Falls, Okla.....	23	16	16	23.6	16.
Fort Smith, Ark.....	22	15	18	24.2	16.
Van Buren, Ark.....	22	14	23	24.9	16.
				22.5	22.
Dardanelle, Ark.....	22	Jan. 25	Jan. 28	25.8	Jan. 25.
		15	18	23.5	17.
Red Basin					
Little Missouri: Boughton, Ark.....	20	Jan. 26	Jan. 29	23.9	Jan. 26.
Saline: Benton, Ark.....	20	Jan. 25	Jan. 28	24.5	Jan. 26.
Ouachita:					
Arkadelphia, Ark.....	17	Jan. 18	Jan. 21	21.7	Jan. 19.
		Jan. 25	Jan. 30	23.3	Jan. 27.
Camden, Ark.....	26	Jan. 20	9	44.1	Jan. 29.
		27	Mar. 4	29.0	Mar. 2.
Monroe, La.....	40	11	Mar. 6	42.5	17-18.
Black: Jonesville, La.....	50	13	(?)	51.8	Mar. 1-4.
Little: Whitecliffs, Ark.....	25	Jan. 26	4	31.1	Jan. 28.
Sulphur:					
Hagansport, Tex.....	38	Jan. 25	1	42.1	Jan. 28.
		14	15	38.5	14.
		24	(?)	42.2	25.
		Jan. 27	8	30.8	Jan. 30.
Naples, Tex.....	22	20	22	22.2	21.
		25	(?)	29.0	28.
Cypress: Jefferson, Tex.....	18	3	4	18.6	4.
Red:					
Fulton, Ark.....	25	Jan. 27	3	32.0	Jan. 30.
Garland, Ark.....	25	Jan. 28	3	29.9	Jan. 31.
Grand Ecore, La.....	33	2	8	35.2	4.
Alexandria, La.....	32	2	12	34.6	6.
Lower Mississippi Basin					
St. Francis:					
Fisk, Mo.....	20	Jan. 20	26	23.8	Jan. 27-29.
				23.8	2.
				23.5	18-19.
St. Francis, Ark.....	18	Jan. 22	Mar. 4	22.6	Jan. 28-29.
				22.8	15.
Parkin, Ark.....	28	4	Mar. 4	29.4	10.
		7	19	32.7	11.
Madison, Ark.....	32	28	Mar. 2	32.0	28-Mar. 1,
				30.0	Jan. 9-10.
Tallahatchie: Swan Lake, Miss.....	26	Jan. 4	(?)	29.2	7.
Yazoo:					
Greenwood, Miss.....	35	Jan. 7	16	38.8	Jan. 12.
				36.0	4.
Yazoo City, Miss.....	29	Jan. 3	(?)	36.2	10.
Mississippi:					
New Madrid, Mo.....	34	Jan. 25	Mar. 7	39.6	1.
				38.7	27.

River and station	Flood stage	Above flood stages— dates		Crest ¹	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM—continued					
Lower Mississippi Basin—Con.					
Mississippi—Continued	Feet			Feet	
Caruthersville, Mo.....	32	Jan. 26	Mar. 8	38.4	2.
Memphis, Tenn.....	34	2	11	37.3	28.
Red River Landing, La.....	45	8	(²)	35.2	6.
Baton Rouge, La.....	35	7	(²)	48.0	23.
Donaldsonville, La.....	28	8	(²)	38.4	22-25.
Reserve, La.....	22	9	(²)	30.4	22-24.
New Orleans, La.....	17	9	(²)	23.6	22-25.
				18.4	24.
Atchafalaya Basin					
Atchafalaya:					
Simmesport, La.....	41	15	(²)	42.1	25.
Melville, La.....	37	6	(²)	39.9	23.
Atchafalaya, La.....	25	Jan. 17	(²)	28.8	23-Mar. 1.
Morgan City, La.....	16	14	16	6.4	26.
		18	(²)		
WEST GULF OF MEXICO DRAINAGE					
Calcasieu: Kinder, La.....	16	22	22	16.2	22.
Sabine:					
Mineola, Tex.....	14	18	21	16.5	19.
		25	Mar. 4	18.2	27.
Gladewater, Tex.....	26	2	9	31.4	5.
Bon Wier, Tex.....	17	11	12	17.5	12.
Elm Fork: Carrollton, Tex.....	6	24	24	6.8	24.
East Fork: Rockwall, Tex.....	10	24	28	17.3	25.
Trinity:					
Dallas, Tex.....	28	24	27	37.3	24.
Rosser, Tex.....	26	24	Mar. 2	34.0	27.
Trinidad, Tex.....	28	25	Mar. 7	39.5	Mar. 2.
Liberty, Tex.....	24	27	Mar. 2	25.2	28.
Rio Grande:					
Del Rio, Tex.....	15	25	25	19.5	25.
Eagle Pass, Tex.....	16	25	26	20.5	26.
PACIFIC SLOPE DRAINAGE					
Columbia Basin					
McKenzie:					
Leaburg, Oreg.....	12	18	19	14.2	18.
Coburg Bridge, Oreg.....	11	18	19	12.3	18.
Calapooya: Holley Oreg.....	10.5	18	18	10.8	18.
Santiam: Jefferson, Oreg.....	13	18	20	19.9	18.
		22	24	16.4	23.
South Yamhill					
		10	10	14.8	10.
Willamina, Oreg.....	8	17	18	13.5	17.
		22	23	10.1	23.
Whiteson, Oreg.....	38	10	12	43.4	11.
		19	19	11.8	18.
Molalla: Canby, Oreg.....	11	23	23	11.0	23.
		10	12	13.3	10.
Tualatin: Dilley, Oreg.....	12	16	27	13.8	17.
		16	27	13.3	22-23.
Willamette:					
Harrisburg, Oreg.....	12	18	20	15.3	19.
		23	24	14.1	23.
Corvallis, Oreg.....	20	20	20	21.1	20.
Albany, Oreg.....	20	19	20	22.8	20.
Salem, Oreg.....	20	19	21	23.3	19.
Oregon City, Oreg.....	12	18	26	15.8	20.
Chehalis Basin					
Satsop: Satsop, Wash.....	34	22	22	35.0	22.
		17	18	16.7	18.
Chehalis: Grand Mound, Wash.....	14.5	22	24	16.7	23.
Puget Sound					
Snohomish: Snohomish, Wash.....	22	17	17	23.0	17.

¹ Provisional.² Continued at end of month.³ Flood stage or higher reached intermittently.